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## General Notes.

### GEOLOGY AND PALEONTOLOGY.

**Schlosser on American Eocene Vertebrata in Switzerland.**<sup>1</sup>—Dr. Max Schlosser has recently<sup>1</sup> reviewed the work of Prof. Rüttimeyer of Basel on the "Eocene Fauna of Egerkingen." In this memoir Dr. Rüttimeyer endeavored to show that there have been found on the Eocene bed of Egerkingen, Switzerland, certain genera of Mammalia which were previously discovered in North America, and had not been known from any part of Europe up to that time. These fossils he named as follows.

Tillodonta. *Calamodon europæus*.

Quadrumana. *Hyopsodus jurensis*; *Pelycodus helveticus*.

Condylarthra. *Phenacodus europæus*; *P. minor*; *Protogonia cartierii*; *Meniscodon pictetii*.

Dr. Schlosser makes the following critical observations on these species.

He considers the *Calamodon*<sup>2</sup> *europæus* to be well established.

*Hyopsodus jurensis* is probably an Artiodactyle allied to Dichobune. The *Pelycodus helveticus* is a lemuroid, but of a genus different from *Pelycodus*. *Phenacodus minor* is probably a Creodont, while the *P. europæus*, *Protogonia cartierii* and *Meniscodon pictetii*, Dr. Schlosser thinks belong to a single genus, which he thinks is *Protogonia* (*Euprotogonia*). He doubts whether the teeth, on which the three species are founded, belong to distinct species.

As a result Schlosser concluded that Rüttimeyer is correct in determining the American genera *Calamodon* (*Conicodon*) and *Protogonia*, (*Euprotogonia*) as occurring in the Egerkingen formation. The lemuroids and creodont are of types common to both continents, while the Dichobunid is European in relationship.

Schlosser further remarks, that a boreal fauna, such as exists at present, was unknown during the Cenozoic ages. Europe was the home

<sup>1</sup> Zoölogischer Anzeiger, 1894, no. 446, p. 157.

<sup>2</sup> A genus of birds has been named *Calamodus*, a name which is in my opinion abundantly distinct from *Calamodon*. As, however, there are persons who, like the American Ornithologists Union, will make this resemblance an excuse for changing the name, I suggest that they call it *Conicodon*, from the shape of the molars, as distinguished from those of *Stylinodon*.

of the Artiodactyla except Oreodontidæ and Tylopoda, of the true Carnivora, and the Monkeys (except the S. American). North America was the home of the Perissodactyla and Amblypoda, and the ancestors of the monkeys and carnivora, during that time.

**The Skull of *Pisodus owenii*.**—It is now a well-established fact that many types of Teleostomous fishes have undergone very little change since the Eocene, or even since the latter part of the Cretaceous period. Several well-defined genera seem to date back thus far, and others are represented by forms that differ in but small particulars. Moreover, a few of the most remarkable specializations in piscine skeletal anatomy characterizing the existing fauna are already recognizable in certain closely related Eocene types, and the progress of discovery is continually adding to the number of known examples. A most striking new case has been lately met with by the present writer among the fishes from the London Clay (Lower Eocene), and this forms the subject of the following notes.

So long ago as 1845, Sir Richard Owen described and figured the tritural dentition of an unknown fish from the London Clay of the Isle of Sheppey under the name of *Pisodus owenii* (ex. Agassiz MS.). The original specimen is preserved in the Museum of the Royal College of Surgeons, and exhibits an ovate pavement of small rounded or polygonal teeth firmly fixed in shallow sockets upon a plate of true bone. Appearances suggested to Sir Richard Owen that the fossil had been attached to another bone of the skull, most probably, as in *Glossodus* and *Sudis*, to a median bone of the hyoid system. Agassiz, who first examined the specimen, supposed it might pertain to a so-called Pycnodont Ganoid; and in Owen's *Paleontology* (edit. 2, 1861, p. 174) *Pisodus* is also doubtfully quoted as a "Ganoid" of uncertain position.

It now appears from a nearly complete skull in the British Museum that the problematical fossil in question is the parasphenoid dentition of a fish remarkably similar in cranial characters to the recent *Clupeoid Albula*. The fact has already been incidentally mentioned in a record of the discovery of *Pisodus* in the Middle Eocene of Belgium; and it only remains to justify, by a detailed description and figures, the recognition of an *Albula*-like fish at so remote a period as that of the Lower Eocene. Dr. Shufeldt's admirable description of the skull of the recent *Albula vulpes* fortunately suffices for requisite comparison. (Dr. Smith Woodward in *Ann. Mag. Nat. Hist. Ser. 6, Vol. XI, 1893.*)

**Geological News, Cenozoic.**—In studying the origin of Lake Cayuga, Mr. R. S. Tarr, has become a convert to the rock-basin theory of lake formation. In a paper recently published he shows that the preglacial tributaries to the Cayuga valley are rock enclosed and that their lowest points are above the present lake surface. This the author holds to be proof positive that Lake Cayuga is a rock-basin. If this be true, a similar course of reasoning would suggest that Lake Ontario is also a rock-basin, from the fact that the preglacial Cayuga River flowed north and was tributary to a river which drained Ontario, and whose channel was above the present surface of the lake. (Bull. Geol. Soc. Am., Vol. 5, 1894.)

The recognition of the extension of the Pine Barren flora of New Jersey through Staten Island, Long Island, Nantucket, Southern Rhode Island, and Massachusetts, suggests to Mr. Arthur Hollick a theory of a continued existence of land connection between New Jersey and southeastern New England, by way of Long Island, during a sufficient time after the final recession of the glacier, for the pine barren flora to have spread and become established there. This theory would seem to be supported by the position and configuration of the chain of islands to the east of Long Island Sound, and by the geological history of this region. If Mr. Hollick's views are correct Long Island, Block Island, Nantucket, Martha's Vineyard, etc., as we now know them, have not been submerged since the final retreat of the glacier, and their separation into islands is a comparatively modern phenomenon due to erosion, and the depression of the costal plain. (Trans. New York, Acad. Sci. Vol., XII, 1893.)

A new theory of the origin of Drumlins has been advanced by Mr. Warren Upham, viz.; they are the result of the accumulation of englacial drift. The author offers the following explanation of the manner of the accumulation. The upper current of the thickened ice above the englacial bed of drift would move faster than the drift, which in like manner would outstrip the lower current of the ice in contact with the ground. Close to the glacial boundary the upper ice must have descended over the lower part. This differential and shearing movement gathered the stratum of englacial drift into the great lenticular masses or sometimes longer ridges of the drumlins, thinly underlain by ice and over-ridden by the upper ice flowing downward to the boundary and bringing with it the formerly higher part of the drift stratum to be added to these growing drift accumulations. The courses of the glacial currents are not determined by the topography of the underlying land, but by the contour of the ice surface. (Proceeds. Boston, Soc. Nat. Hist., Vol. XXVI, 1893.)